

AMENDMENTS TO THE DRAWINGS

Applicants herein submit drawings Figs. 4(a) to 7(b).

Figs. 4(a) and 4(b) have been added to show an example of a radially anisotropic annular sintered magnet of the present invention. Fig. 4(c) has been added to show a skew angle of the magnet.

Figs. 5(a) and 5(b) and Figs. 6(a) and 6(b) have been added to show other examples of a radially anisotropic annular sintered magnet of the present invention.

Fig. 7(a) has been added to show an example of a permanent magnet motor of the present invention.

Fig. 7(b) has been added to show a skew angle of the stator tooth. The line A-B is a boundary of the stator teeth and corresponds to the skew of magnetic flux density of the magnet.

REMARKS

Claims 1-5 are pending in the present application. Figs. 4(a) to 7(b) are herein added.

No new matter has been introduced.

Objections to Drawings

The drawings were objected to under 37 CFR 1.83(a) providing that drawings must show every feature of the invention specified in the claims.

Accordingly, Figs. 4(a) to 7(b) have been added to show the angle 10 degrees in claim 3, the skew angle of the rotor pole in claim 4, and the skew angle of the stator teeth in claim 5.

These new drawings do not introduce any new matter because they merely illustrate the concepts disclosed in the original disclosure.

Figs. 4(a) and 4(b) show an example of a radially anisotropic annular sintered magnet of the present invention. In this example, whole of the boundary between N-pole and S-pole is located within the minimum position of remanence.

Figs. 5(a) and 5(b) and Figs. 6(a) and 6(b) show other examples of a radially anisotropic annular sintered magnet of the present invention. In these examples, a part of the boundary between N-pole and S-pole is located within the minimum position of remanence.

In the example of Figs. 5(a) and 5(b), the center portion of the boundary is located within the minimum position of remanence.

In the example of Figs. 6(a) and 6(b), the end portion of the boundary is located within the minimum position of remanence. These magnets are magnetized in 4 poles.

The claimed magnet is further magnetized for use of a rotor of a motor. Final magnetization of the magnet is performed in another magnetizing process which is different from the process where magnetic field is applied while compacting into the annular magnet.

Fig. 4(c) shows a skew angle of the magnet. The line A-B shows a skew of magnetic flux density. The line B-B' is perpendicular to the bottom face. The line B-B' is along the outer peripheral face. The intersection 'O' is a center of the circumference. Skew angle is shown as the angle of the line A-O and line B'-O.

Fig. 7(a) shows an example of a permanent magnet motor of the present invention. In this case, the stator has six stator teeth. The magnet corresponds to Figs. 4(a) and 4(b).

Fig. 7(b) shows a skew angle of the stator tooth. The line A-B is a boundary of the stator teeth and corresponds to the skew of magnetic flux density of the magnet. The line B-B' is perpendicular to the bottom face. The line B-B' is along the inner peripheral face. The intersection 'O' is a center of the circumference. Skew angle is shown as the angle of the line A-O and line B'-O.

Rejections under 35 USC §103(a)

Claims 1-3 were rejected under 35 U.S.C. 103(a) as being obvious over Meckling (U.S. Patent No. 4,004,167) in view of Mita et al. (U.S. Patent No. 5,841,212).

Applicants respectfully traverse this rejection.

Meckling (U.S. Patent No. 4,004,167) discloses a stator including a one piece annular member. The annular member includes magnetically anisotropic particles of magnetically attractable ferrite material which are embedded in a matrix of hardened synthetic plastic material.

The Examiner alleged that Meckling teaches a radially anisotropic sintered magnet of annular shape having a remanence, in which the remanence in a radial direction of the annulus increases and decreases at intervals of 90° in a circumferential direction of the annulus. However, Meckling does not disclose the subject matter of “the remanence in a radial direction of the annulus increases and decreases at intervals of 90° in a circumferential direction of the annulus.

In Meckling, the magnet shown in Fig. 1 is magnetized in 2 poles. The remanence does not increase and decrease at intervals of 90°. Also, the magnet shown in Fig. 11 and Fig. 14 are 2-pole magnets. The magnets include two hardened plastic materials 96, 96. The plastic material is not a magnetic material. The magnet shown in Fig. 11 or Fig. 14 does not have a radial orientation at least in the two hardened plastic materials.

Mita et al. (U.S. Patent No. 5,841,212) discloses magnets consisting of four isolated pieces. Thus, Mita et al. does not teach or suggest a radially anisotropic sintered magnet of annular shape. Moreover, Mita et al. do not teach or suggest the claimed subject matter of “the remanence in a radial direction of the annulus increases and decreases at intervals of 90° in a circumferential direction of the annulus.”

For at least these reasons, claim 1 patentably distinguishes over Meckling and Mita et al. Claims 2 and 3, depending from claim 1 also patentably distinguish over Meckling and Mita et al. for at least the same reason.

Therefore, the 35 U.S.C. 103(a) rejection over Meckling and Mita et al. should be withdrawn.

Claims 4-5 were rejected under 35 U.S.C. 103(a) as being obvious over Meckling in view of Mita et al. and further in view of Fukushima (U.S. Patent No. 6,657,349).

Claims 4 and 5 depend from claim 3, which patentably distinguish over Meckling and Mita et al.

Like Mita et al., Fukushima (U.S. Patent No. 6,657,349) does not teach or suggest the claimed recitation: "the remanence in a radial direction of the annulus increases and decreases at intervals of 90° in a circumferential direction of the annulus." Therefore, Fukushima does not remedy the deficiencies of Meckling and Mita et al. discussed above.

For at least these reasons, claims 4 and 5 patentably distinguish over Meckling, Mita et al. and Fukushima.

Therefore, the 35 U.S.C. 103(a) rejection over Meckling, Mita et al. and Fukushima should be withdrawn.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

Application No.: 10/589,235
Art Unit: 2834

Amendment under 37 CFR §1.111
Attorney Docket No.: 062892

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Sadao Kinashi", written in a cursive style.

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